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Remarks/Arguments

Claims 1-3, 5-14 and 16–26 are pending and claims 1-3, 5-14 and 16–26 stand rejected. In this response claims 1, 5, 12, 16 and 22 are amended. Claims 5 and 16 have been amended to correct their dependencies. No new matter has been introduced.

35 U.S.C. §103

In the Office Action, the Examiner rejected claims 1-3, 5-14 and 16–26 under 35 U.S.C. §103(a), as being unpatentable over Modafferi, U.S. Patent No. 4,771,466, in view of Tanida et al., U.S. Patent No. 5,243,656.

Modafferi discloses that combining first-order high- and low-pass filters using ideal speakers, each filter having the same -3 dB frequency (in col. 2 lines 36-39, Modafferi points out the same corner frequency 1/T for each filter), provides a perfectly flat amplitude response and no phase shift at any frequency (see col. 2, lines 54-62). Rumreich, however, observes (pg. 2, lines 3-8):

> "Although the above first-order crossover network functions satisfactorily, the low-pass and high-pass filters at the crossover frequency are not in-phase. As such, such a first-order network cannot provide the following benefits of an in-phase crossover network: smoother frequency response due to increased stop-band rejection, and improved polar behavior (lobing)."

Examiner cites Modafferi, col.2, lines 60-62, as anticipating Rumreich's claim 1 recitation, "... impedances of the first and second components are selected such that a phase difference at the crossover frequency between respective responses of the first and second loudspeakers is no greater than 60 degrees", however first order low- and high-pass filters having equal "corner" frequencies, 1/T, as disclosed in Modafferi are known to exhibit 90° phase shifts at their respective corner frequencies (see Rumreich pg. 1,

lines 24-26). Rumreich teaches to improve the response of conventional first-order crossover networks with increased stop-band rejection, and improved polar behavior, by the claim 1 recitation:

> "a first component of the input audio signal coupled to the first loudspeaker to form a low-pass filter for providing the first loudspeaker low frequency band signals; and a second component of the input audio signal coupled to the second loudspeaker to form a high-pass filter for providing the second loudspeaker high frequency band signals, wherein the low-pass and the high-pass filters are first-order filters and wherein the first component is coupled in series to the first loudspeaker connected in a first polarity, the second component is coupled in series to the second loudspeaker connected in a second polarity, and the second polarity is an inverse of the first polarity, and impedances of the first and second components are selected such that a phase difference at the crossover frequency between respective responses of the first and second loudspeakers is no greater than 60 degrees."

Tanida discloses no first-order crossover network for dividing an input audio signal, no first component to form a low-pass filter, no second component to form a high-pass filter and no component of the input audio signal to a first speaker in a first polarity and no component of the input audio signal to a second speaker in a second polarity, and the second polarity being the inverse of the first polarity. Rather, Tanida discloses to improve the power efficiency in a multichannel audio circuit wherein a plurality of input signals are supplied to corresponding amplifiers having at least one of the input signals inverted and the speaker connected to the inverted signal connected in a polarity opposite the other speakers. Because of this double inversion, the net result is that the plurality of signals radiated from the corresponding speakers are all in the same phase or polarity. Note that there is no dividing of an input signal, one component being applied to a speaker in a polarity which is inverse

to connection of a second component of the input audio signal. Tanida merely inverts one signal of a multichannel audio circuit twice, once in an amplifier and a second time by inverse connection of its corresponding speaker.

There is no suggestion in Modafferi or in Tanida, either singly or together, of:

> "A first-order crossover network for dividing an input audio signals into high and low frequency bands at a crossover frequency in a loudspeaker system having first and second loudspeakers having respective impedance, each loudspeaker having positive and negative terminals, the first-order crossover network comprising;
>
> 'a first component of the input audio signal coupled to the first loudspeaker to form a low-pass filter for providing the first loudspeaker low frequency band signals; and a second component of the input audio signal coupled to the second loudspeaker to form a high-pass filter for providing the second loudspeaker high frequency band signals, wherein the low-pass and the high-pass filters are first-order filters and wherein the first component is coupled in series to the first loudspeaker connected in a first polarity, the second component is coupled in series to the second loudspeaker connected in a second polarity, and the second polarity is an inverse of the first ~~priority~~ polarity, and impedances of the first and second components are selected such that a phase difference at the crossover frequency between respective responses of the first and second loudspeakers is no greater than 60 degrees.",

as is recited in claim 1. With the amendment of claim 1, the Applicant respectfully asserts the rejection is traversed.

Claims 12 and 22 have been amended in a manner similar to the amendment of claim 1 and thus are believed allowable for all the reasons enumerated above. Applicant respectfully requests the rejection of claims 1, 12 and 22 under 35 U.S.C. §103(a) be withdrawn. Claims 2–3, 5-11, 13-21 and 23–26, being properly drawn to independent claims believed to be allowable are also

allowable. Withdrawal of rejections of dependent claims 2–3, 5-11, 13-21 and 23–26 is respectfully requested.

Conclusion

Having fully addressed the Examiner's objections and rejections, it is believed that, in view of the preceding amendments and remarks, this application stands in condition for allowance. Accordingly then, reconsideration and allowance are respectfully solicited. If, however, the Examiner is of the opinion that such action cannot be taken, the Examiner is invited to contact the Applicant's attorney at (609) 734-6828, so that a mutually convenient date and time for a telephonic interview may be scheduled.

No additional fee is believed due. However, if an additional fee is due, please charge the additional fee, or credit any overpayment, to Deposit Account No. 07-0832.

Respectfully submitted,
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